

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

(DRAFT)

Title V, Construction / Operating

Permit: V-08-029

Jim Beam Brands Clermont Distillery

Clermont, KY 40110

10-30-2008

Chris Walling, Reviewer

SOURCE ID: 21-029-00005

AGENCY INTEREST: 450

ACTIVITY: APE20080001

**SOURCE DESCRIPTION:**

On June 18, 2008 the Jim Beam Brands Company, Clermont distillery applied to the Division for a construction and renewal operating permit for a bourbon distillery in Clermont, Kentucky. The Clermont facility makes distilled spirits. Grain is unloaded and conveyed to hammermills where it is ground. The grain is fed into mash cookers along with water, and the grain starches are converted to sugars by heating. The cooked grain / water mixture is fed into fermenter vessels as a batch operation to convert the sugars to ethanol. After an appropriate residence time, the mixture is processed through distillation columns and condensers. The condensed liquid is fed to spirits tanks and then gauged at the cistern tanks prior to barrel filling. The spent stillage is then dried with a ring dryer and put into a storage room. Whiskey from the cistern tanks is put into barrels until the appropriate age is reached. The barrels are then gravity dumped, rolled, and rinsed at the dumping station. After dumping, the whiskey is fed to the regauge tanks, where it may be processed and sent to be loaded for shipment.

The source is adding two 37,500 gallon process tanks to the facility, which will not increase the total capacity. The source is also replacing the existing ash removal system for the coal-fired boiler with a new pneumatic system.

Until the HCl removal efficiency from the Clermont facility can be verified through testing, the facility will cap its coal usage to 15,000 tons per year (tpy). Using an EPA emission factor of 1.2 lb HCl/ton, this will limit facility HCl emissions to 9 tpy. Following the completion of the testing event (completion of equipment installation and testing is expected in the spring or summer of 2009), an algorithm will be developed that expresses HCl emissions as a function of lime addition and coal feed rates. After this algorithm is developed Jim Beam Brands will submit a permit modification application requesting that this algorithm serve as the mechanism by which to demonstrate that future facility HCl emissions stay below the major source threshold for HAP emissions.

The Division concurs that Jim Beam Brands may use the emission factors from the most current AP-42 for the hydrogen chloride emissions until new information is gathered from the compliance test that shall be performed within six months from issue of the final permit. Control efficiencies and emission factors derived from compliance testing are to replace the emission factor currently listed in the permit, and shall be used to calculate future emissions.

**COMMENTS:**

Emission Unit 01: Grain Handling Operations

Emission Unit 02: Fermentation Process

Emission Unit 03: Spent Grain Drying

Emission Unit 04: Dried Grain Storage Silos

Emission Unit 05: Barrel Filling, Aging, and Dumping

Emission Unit 06: Processing and Bottling Operations

Emission Unit 07: Indirect Heat Exchanger

Emission Unit 08: Indirect Heat Exchanger

Emission Unit 09: Indirect Heat Exchanger

Emission Unit 10: Wastewater Treatment Process

**APPLICABLE REGULATIONS:**

401 KAR 63:010, Fugitive emissions is applicable to each affected facility which emits or may emit fugitive emissions and is not elsewhere subject to an opacity standard within the administrative regulations of the Division for Air Quality.

401 KAR 61:020, Existing process operations, applicable to an emission unit that commenced prior to July 2, 1975.

401 KAR 59:010, New process operations, applicable to an emissions unit that commenced on or after July 2, 1975.

401 KAR 61:015, Existing indirect heat exchangers, applicable for an emissions unit with a capacity of 250 MMBtu/hour or less and commenced before April 9, 1972.

401 KAR 59:015, New indirect heat exchangers, applicable to an emissions unit with a capacity of less than 250 MMBtu/hour which commenced on or after April 9, 1972.

40 CFR Part 64, Compliance Assurance Monitoring (CAM) (For Hydrogen Chloride and PM)

**Emission Unit 01: Grain Handling Operations**

Pursuant to 401 KAR 63:010, Section 3, reasonable precautions shall be taken to prevent particulate matter from becoming airborne. Such reasonable precautions shall include, when applicable, but not be limited to the following:

1. Application and maintenance of asphalt, water, or suitable chemicals on roads, material stockpiles, and other surfaces which can create airborne dusts.

2. Installation and utilization of hoods, fans, and fabric filters to enclose and vent the emissions generated from the processing of dust generating materials, or use of water sprays or other measures to suppress the dust emissions during handling.

Pursuant to 401 KAR 63:010, Section 3, discharge of visible fugitive emissions beyond the property line is prohibited.

### **Emission Unit 03: Spent Grain Drying**

Pursuant to 401 KAR 61:020, Section 3(2)(a), particulate emissions into the open air shall not exceed  $[4.10 (P)^{0.67}]$  lbs/hour based on a three-hour-average, where P is the processing rate in tons/hour of dried grain averaged on a monthly basis. Compliance with the allowable particulate standard may be demonstrated by calculating particulate emissions using grain processing rates, emission factor information, and scrubber control efficiency as follows:

$$\text{PM Emissions (lbs/hour) from grain drying} = (\text{lbs / ton controlled emission factor from most recent stack test}) \times (\text{grain processing rate in tons/hour})$$

Pursuant to 401 KAR 61:020, Section 3(1)(a), visible emissions shall not equal or exceed 40% opacity based on a six-minute-average.

Pursuant to 401 KAR 50:045, the permittee shall conduct a stack test for particulate emissions by the start of the fourth year of this permit (or the fourth year from the last stack test) to demonstrate compliance with the applicable standard.

The permittee shall monitor the processing rate and hours of operation on a monthly basis.

The permittee shall perform a qualitative visual observation of the opacity of emissions from the stack on a weekly basis and maintain a log of the observations. If visible emissions from the stack are seen, the permittee shall determine the opacity of emissions by U.S. EPA Reference Method 9 and instigate an inspection of the control equipment for any necessary repairs.

The wet scrubber shall be operated to maintain compliance with permitted emission limitations in accordance with the manufacturer's specifications and/or standard operating practices.

### **Emission Unit 04: Dried Grain Storage Silos**

Pursuant to 401 KAR 59:010, Section 3(2), particulate emissions from the stack shall not exceed  $[3.59 (P)^{0.62}]$  lbs/hour based on a three-hour-average, where P is the processing rate in tons/hour. Compliance with the allowable particulate standard may be demonstrated by calculating particulate emissions using grain processing rates, emission factor information, and baghouse control efficiency as follows:

Pursuant to 401 KAR 59:010, Section 3(1)(a), any continuous emissions into the open air shall not equal or exceed 20% opacity based on a six-minute-average.

The permittee shall assure continuing compliance with the particulate emissions and opacity limitations by ensuring proper operation of baghouses. Proper operation of baghouses can be ensured by fulfilling visual observation as specified in monitoring requirements below.

The permittee shall perform a qualitative visual observation of the opacity of emissions from the

stack on a weekly basis and maintain a log of the observations. If visible emissions from the stack are seen, the permittee shall determine the opacity of emissions by U.S. EPA Reference Method 9 and instigate an inspection of the control equipment for any necessary repairs.

The permittee shall monitor the grain processing rate and hours of operation on a monthly basis.

The baghouse shall be operated to maintain compliance with permitted emission limitations in accordance with manufacturer's specifications and/or standard operating practices.

### **Emission Unit 07:    Natural-Gas Fired Indirect Heat Exchanger**

To preclude the applicability of 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality, source-wide emissions of sulfur dioxide shall not exceed 225 tons in any twelve (12) consecutive months.

Each unit is considered to be in compliance with the PM, SO<sub>2</sub>, and opacity standards while burning natural gas, and in compliance with the SO<sub>2</sub> limit while burning fuel oil as long as the sulfur content of the fuel oil is less than or equal to 0.5% by weight. If fuel oil of over 0.5% sulfur is used, the Division shall be notified immediately and a compliance demonstration will be required.

Pursuant to 401 KAR 61:015, Section 4(1), particulate emissions shall not exceed 0.41 lb/MMBtu based on a three-hour-average. Compliance with the allowable particulate standard may be demonstrated by calculating particulate emissions for each respective fuel using fuel oil usage rates, fuel analysis, and emission factor information:

#### **No. 2 fuel-oil - SCC 1-02-005-01**

PM Emissions (lb/MMBtu) from combustion of No. 2 fuel-oil = (U.S. EPA approved or AP-42 emission factor: 2 lbs / 10<sup>3</sup> gallons) / (heating value from fuel analysis in MMBtu/ 10<sup>3</sup> gallons); and

#### **No. 6 fuel-oil - SCC 1-02-004-01**

PM Emissions (lb/MMBtu) from combustion of No. 6 fuel-oil = (U.S. EPA approved or AP-42 emission factor: [ (9.19(S) + 3.22) lbs / 10<sup>3</sup> gallons] / (heating value from fuel analysis in MMBtu/10<sup>3</sup> gallons) where S is the percent weight sulfur in the fuel oil.

Pursuant to 401 KAR 61:015, Section 4(3), emissions shall not exceed 40% opacity based on a six-minute-average.

Pursuant to 401 KAR 61:015, Section 5(1), sulfur dioxide emissions shall not exceed 4.0 lbs/MMBtu based on a twenty-four-hour average. Compliance with the allowable sulfur dioxide standard may be demonstrated by calculating sulfur dioxide emissions for each respective fuel using fuel oil usage rates, vendor's specifications, fuel analysis, and emission factor information:

#### **No. 2 fuel-oil - SCC 1-02-005-01**

SO<sub>2</sub> Emissions (lb/MMBtu) from combustion of No. 2 fuel-oil = (U.S. EPA approved or AP-42 emission factor: 142S lbs / 10<sup>3</sup> gallons) / ( heating value from fuel analysis in MMBtu/10<sup>3</sup> gallons).

#### **No. 6 fuel-oil - SCC 1-02-004-01**

SO<sub>2</sub> Emissions (lb/MMBtu) from combustion of No. 6 fuel-oil = (U.S. EPA approved or

AP-42 emission factor: 157S lbs / 10<sup>3</sup> gallons) / (heating value from fuel analysis in MMBtu/ 10<sup>3</sup> gallons).

Pursuant to 401 KAR 50:045, the permittee shall conduct a stack test for particulate matter, oxides of nitrogen, carbon monoxide, hydrogen chloride, and sulfur dioxide by the start of the fourth year of this permit (or the fourth year from the last stack test) to demonstrate compliance with the applicable standard.

The permittee shall monitor the amount of each fuel burned on a monthly basis.

The permittee shall monitor the heat content and sulfur content of the fuel oil burned on a monthly basis. The permittee may use fuel supplier certification to meet this requirement.

Tons of sulfur dioxide emissions due to No. 2 or No. 6 fuel oil usage shall be calculated for each month using the total No. 2 or No. 6 fuel oil usage rate and the average fuel oil heat and sulfur content for that month.

The permittee shall perform a qualitative visual observation of the opacity of emissions from the stack on a weekly basis when burning fuel oil and maintain a log of the observations. If visible emissions from the stack are seen, the permittee shall determine the opacity of emissions by U.S. EPA Reference Method 9 and instigate an inspection of the control equipment for any necessary repairs.

If fuel oil is burned in the unit, the permittee shall submit semi-annual reports including the fuel supplier certification and a certified statement signed by the owner or operator of the affected facility that the records of the fuel supplier certifications submitted represent the fuel oil combusted during that six month period.

#### **Emission Unit 08:    Coal-Fired Indirect Heat Exchanger**

The permittee has stated intentions to perform tests to calibrate a lime injection emissions control system for hydrogen chloride. When test results have been analyzed to provide an equation to describe the performance of the control system in terms of the relationship between the rate of lime injection and the amount of hydrogen chloride reduced, then the permittee may submit for a Permit Revision to remove the 15,000 ton per year limit on coal consumed.

To preclude the applicability of 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality, source-wide emissions of sulfur dioxide shall not exceed 225 tons in any twelve (12) consecutive months.

#### **Compliance Demonstration:**

Monthly sulfur dioxide emissions can be calculated using the following formula:

$$\text{Sulfur dioxide emissions (tons)} = \frac{EF \text{ (lbs / SCC units)} \times \text{monthly fuel use (SCC units)}}{2000 \text{ (lbs / ton)}}$$

*EF* = emission factor from AP-42 Section 1 (coal= 38S lbs/ton)

*SCC units* = tons

To demonstrate compliance with this emission limitation, the twelve-month rolling total shall be calculated monthly and reported semi-annually (see Section F of the Permit). The permittee shall

maintain onsite a log of the 12-month rolling total available for review by the Division.

To preclude applicability of CAA Section 112(j), source-wide emissions of hydrogen chloride shall not exceed 9.0 tons in any twelve (12) consecutive months.

To preclude applicability of Section 112(j) of the Clean Air Act source-wide usage rate of coal shall not exceed 15,000 tons per year (12 month rolling total) and shall further be restricted so emission limitations, as set forth in Section D of the Permit– Source Emission Limitations and Testing Requirements, for hydrogen chloride (HCl) and total HAPs are not exceeded.

Pursuant to 401 KAR 59:015, Section 4(1)(c), particulate emissions shall not exceed 0.286 lb/MMBtu based on a three-hour-average.

Pursuant to 401 KAR 59:015, Section 4(2)(b), emissions shall not exceed 20% opacity based on a six minute average, except that a maximum of 40% opacity, based on a six minute average, shall be permissible for not more than 6 consecutive minutes in any consecutive 60 minutes during cleaning the fire-box or blowing soot.

Pursuant to 401 KAR 59:015, Section 5(1)(c), sulfur dioxide emissions shall not exceed 1.81 lb/MMBtu based on a twenty-four-hour-average.

Compliance Demonstration:

The permittee may assure compliance with the sulfur dioxide standard by calculating sulfur dioxide emissions using the following formula:

$$\text{Sulfur Dioxide Emissions (lb / MMBtu)} = \left[ \frac{EF \text{ (lb / ton)} \times S}{\text{Heating value of coal (MMBtu / ton)}} \right]$$

EF = 38, emission factor from U.S. EPA AP-42

S = percent sulfur in coal

In order to preclude CAA 112 (j), source-wide emissions of hydrogen chloride shall not exceed 9.0 tons in any twelve (12) consecutive months.

While burning natural gas this unit is considered to be in compliance with PM, HCl, SO<sub>2</sub>, and opacity standards.

Pursuant to 401 KAR 50:045, the permittee shall submit a schedule within eighteen months from the issuance of the final permit #V-08-029 to conduct at least one performance test for particulate matter, oxides of nitrogen, carbon monoxide, hydrogen chloride, and sulfur dioxide within five years of April 3, 2007, the date of the previous performance test.

The permittee has stated intentions to perform tests to calibrate a lime injection emissions control system for hydrogen chloride. When test results have been analyzed to provide an equation to describe the performance of the control system in terms of the relationship between the rate of lime injection and the amount of hydrogen chloride reduced, then the permittee may submit for a Permit Revision to remove the 15,000 ton per year limit on coal consumed.

Pursuant to 401 KAR 50:045, performance tests used to demonstrate compliance with the particulate matter and sulfur dioxide standard shall be conducted according to approved U.S. EPA reference

methods. The HCl emission rate shall be determined using EPA Reference Method 26. The performance tests shall be conducted using coal of lesser or equal heat content than that which will be burned for production, and greater or equal ash content, sulfur content, and chlorine content.

Pursuant to 40 CFR 64.6, Compliance Assurance Monitoring, Table 1 (see below) shows the monitoring approach for particulate matter (PM). The permittee shall conduct this monitoring and fulfill all other obligations specified in 40 C.F.R §§ 64.7 through 64.9.

**TABLE 1 - MONITORING APPROACH**

Applicable CAM Requirement	PM/PM <sub>10</sub> limits
General Requirements	<p>(1) 0.286 lb/MMBtu filterable particulate limit, based on a 3-hour average</p> <p>(2) Less than 20% Opacity except (1) maximum of 40% opacity for not more than 6 consecutive minutes in any consecutive 60 minutes during cleaning the fire-box or blowing soot, and (2) during boiler startup when manufacturer's recommendations are followed.</p>
Monitoring Methods and Location	<p>(1) Differential pressure across the baghouse shall be monitored; proper operation of the baghouse shall be maintained.</p> <p>(2) Daily visual observations of the stack plume shall be performed. USEPA reference Method 9 shall be performed if visual emissions are observed.</p>
<p>Indicator Ranges</p> <p>The permittee may adjust the indicator ranges pursuant to 40 CFR 64.7 (e) based on results from subsequent performance tests for PM compliance and with the Division's approval.</p>	<p>(1) The baghouse has an operating range of 1-10" (w.c.) of pressure drop, in accordance with manufacturer's specifications. An inspection of the baghouse shall be performed if pressure drops occur outside the operating range. Baghouse cleaning will begin at 3.5" w.c. differential pressure and stop at 6.5" w.c. differential pressure.</p> <p>(2) The presence of visible emissions during normal boiler operations shall require the permittee to initiate opacity monitoring in accordance with USEPA Reference Method 9. The permissible indicator range for Method 9 readings shall be 0 – 20% opacity.</p>
Data Collection Frequency	<p>(1) Baghouse differential pressure shall be recorded continuously on an ISQL server.</p> <p>(2) Visual observations of the stack plume shall be performed daily when the boiler is operating. USEPA Reference Method 9 observations shall be collected and an inspection of the baghouse shall be performed when visible emissions from the stack are observed.</p>
Averaging Period	<p>(1) Baghouse differential pressure readings records from the ISQL server shall be analyzed to show pressure drop as a function of time. Pressure drop values shall be marked on a scaled axis if a graph is used. Exceedances and excursions of the operating range shall be specifically identified. Analysis of the baghouse differential pressure readings shall be included in the semiannual report.</p> <p>(2) Reference method 9 readings, if required, shall be reported as 6-minute averages.</p>
Recordkeeping	<p>(1) Baghouse operating parameters shall be maintained for a period of 5 years.</p> <p>(2) Daily visual observations and Method 9 readings (if any) shall be maintained for a period of 5 years.</p>
QA/QC	<p>An excursion for PM emissions shall be defined as (1) three consecutive baghouse differential pressure readings outside the indicator range listed above in a rolling 24-hour period and (2) one six minute average opacity reading collected using USEPA Reference Method 9 that is above the opacity limit mentioned above.</p> <p>The permittee shall initiate an investigation and take corrective action for each excursion.</p> <p>The Quality Improvement Plan (QIP) threshold for baghouse pressure drop is 5 excursions within a rolling 3-month period. This threshold level is 5 percent (5%) of the total 24-hour data recording periods. The QIP threshold for Method 9 observations is either (1) 4 excursions in a rolling 3-month period or (2) 3 consecutive weekly excursions.</p>

	<p>If the QIP threshold is triggered in a semiannual reporting period, a QIP shall be developed and implemented. Baghouse monitoring parameters shall be maintained and operated in accordance with manufacturer recommendations. Records of Method 9 certifications shall be maintained. Differential pressure instrumentation shall be calibrated a minimum of once per year. The baghouse shall be externally inspected daily and internally inspected at least once per year. Records of all inspections and calibrations shall be maintained.</p>
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Pursuant to 40 CFR §64.7(e), new indicator ranges for the CAM Plan may be reestablished from subsequent stack tests, with approval by the Division.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall perform a qualitative observation of the opacity emissions from the stack on a daily basis and maintain a log of the observations. If visible emissions from the stack are seen, then the opacity shall be determined by EPA Reference Method 9 and if the opacity reading is greater than 20 percent, then the permittee must initiate an inspection of the equipment for any repairs.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor the sulfur, chlorine, and heat content of each shipment of coal received. The permittee may use approved EPA or ASTM test methods or fuel supplier certification to meet this requirement.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor the amount of coal burned on a monthly basis.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor the average lime feed rate (lb/hr) and lime usage (tons) on a monthly basis.

Pursuant to 401 KAR 50:055, Section 2, the baghouse and lime injection system shall be operated to maintain compliance with permitted emission limitations in accordance with manufacturer's specifications and/or standard operating practices.

### **Emission Unit 09: Natural Gas-Fired Indirect Heat Exchanger**

In order to ensure non-applicability of 401 KAR 51:017 (Prevention of Significant Deterioration of Air Quality), the emissions of sulfur dioxide shall not exceed 36 tons in any twelve (12) consecutive months.

While burning natural gas, this unit is considered to be in compliance with PM, SO<sub>2</sub> and opacity standards.

Pursuant to 401 KAR 59:015, Section 4(1)(c), particulate emissions shall not exceed 0.28 lb/MMBtu based on a three-hour-average. Compliance with the allowable particulate standard may be demonstrated by calculating particulate emissions using fuel oil usage rates, fuel analysis, and emission factor information:

#### **No.2 Fuel oil - SCC 1-03-005-01**

PM Emissions (lb/MMBtu) from combustion of fuel oil = (U.S. EPA approved or AP-42 emissions factor: 2.0 lbs / 10<sup>3</sup> gallons) / (heating value from fuel analysis in MMBtu/10<sup>3</sup> gallons).

Pursuant to 401 KAR 59:015, Section 5(1), sulfur dioxide emissions shall not exceed 0.84



lb/MMBtu based on a twenty-four-hour average. Compliance with the allowable sulfur dioxide standard may be demonstrated by calculating sulfur dioxide emissions using fuel oil usage rates, vendor's specifications, fuel analysis, and emission factor information:

**No.2 Fuel oil - SCC 1-03-005-01**

SO<sub>2</sub> Emissions (lb/MMBtu) from combustion of fuel oil= (U.S. EPA approved or AP-42 emission factor: 142S lbs / 10<sup>3</sup> gallons) / (heating value from fuel analysis in MMBtu / 10<sup>3</sup> gallons).

Pursuant to 401 KAR 59:015, Section 4(2), emissions shall not exceed 20% opacity based on a six minute average, except that a maximum of 40% opacity based on a six minute average, shall be permissible for not more than 6 consecutive minutes in any consecutive 60 minutes during cleaning the fire-box or blowing soot.

Pursuant to 401 KAR 50:045, the permittee shall conduct a stack test for particulate matter, oxides of nitrogen, carbon monoxide, hydrogen chloride, and sulfur dioxide by the start of the fourth year of this permit (or the fourth year from the last stack test) to demonstrate compliance with the applicable standard.

The permittee shall monitor the heat content and sulfur content of the fuel oil burned on a monthly basis. The permittee may use fuel supplier certification to meet this requirement.

Tons of sulfur dioxide emissions due to No. 2 fuel oil usage shall be calculated for each month using the total No. 2 fuel oil usage rate, and the average fuel oil sulfur and heat content for that month.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall perform a qualitative observation of the opacity emissions from the stack on a weekly basis and maintain a log of the observations. If visible emissions from the stack are seen, then the opacity shall be determined by EPA Reference Method 9 and if the opacity reading is greater than 20 percent, then the permittee must initiate an inspection of the equipment for any repairs.

**CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.